Aim: Inadvertent perioperative hypothermia has negative consequences on patients and resources. This audit aimed to compare practice at Airedale General Hospital against NICE standards.
Method: This was a prospective audit conducted over a two-week period (26/04/12 - 10/05/12). Elective and acute adult general surgical patients undergoing intermediate grade surgery and above under general or/and regional anaesthesia were included.
Results: NICE standards were set at 100% compliance for each criterion audited in this study. There were mixed results. Significant failings were found in the preoperative phase. None of the 28 patients were given written advice about perioperative hypothermia or had their temperatures measured in the hour before theatre transfer. Active warming therefore was not provided accordingly. Better results were achieved in the intraoperative phase; 57% of patients had temperature measurements every 30 minutes, 79% of patients received appropriate active warming and 68% of patients received warmed intravenous fluids. Postoperative care was excellent; all patients had temperature measurements in recovery on arrival and before departure. Two patients were sub-36C before departure. They received appropriate active warming before leaving recovery.
Conclusions: These results call for similar emphasis to be placed in the earlier perioperative period to avoid the harm of inadvertent perioperative hypothermia.

0363: CREEP DEFORMITY OF VERTEBRAL BONE: THE CHALLENGE OF ARCHITECTURAL IMAGING

Eleanor Zimmermann[1], Simon Merrick[2], Phillip Pollintine[2], Michael Adams[2]. [1] *Peninsula College of Medicine & Dentistry, Exeter, UK;* [2] *University of Bristol, Bristol, UK.*

Creep deformity of vertebrae is defined as continuous deformation over constant physiological loading. Creep has been shown to contribute to vertebral deformities and wedge fractures in the elderly, leading to senile kyphosis.
We used microCT analysis combined with a novel barium staining technique to investigate the role of microcrack growth in creep deformity of human bone. Our main objective was to assess the relationship between creep deformity and the change in barium precipitation in human vertebral trabecular bone. 13 cubes of vertebral trabecular bone, with dimensions 12mm±0.5mm, were dissected from 4 cadaveric spines (T2-T9). Mean donor age was 84 (77–93) years. Cubes were stained with barium sulphate and scanned by microCT, before and after 2 hours of creep loading with a mean stress of 0.75 MPa.
Mean creep deformation was 6,470μs (0.65%). Paired t-tests performed on areas of barium staining, before and after creep loading, showed no significant difference. Staining was not significantly correlated to spinal level ($r=0.42$, $p>0,05$), or to creep deformity ($r=0.02$, $p>0.05$). The barium precipitation staining method was not successful in identifying creep-induced microcracks. Microcracks may close up if staining is delayed (creep recovery). This method of architectural analysis in creep deformity is not easily transferable.

0487: PEER TO PEER TEACHING WORKSHOP ON HEAD AND NECK AND NEUROANATOMY CAN HELP MEDICAL STUDENTS LEARN CLINICALLY APPLIED ANATOMY

Charlotte Rowley, Khaleel Hamdulay, Mohammed Mughal. *Leicester Scrubs Surgical Society, Leicester, UK.*

Background: Anatomy teaching has greatly changed over the years. This has resulted in medical students having a much more superficial level of anatomy knowledge than in the past when taught in its pure form. While integration of all aspects of preclinical medicine is important, a thorough anatomical background cannot be sacrificed.
Methods: Medical students from the University of Leicester attended a revision workshop focusing on applied head and neck anatomy. Their knowledge was assessed by short answer question (SAQ) quiz prior to small group teaching. Four weeks later the SAQ was repeated. This model was also used for a neuroanatomy workshop.
Results: A total of 69 students were assessed, where the average score was 48.2% (23.12/48). At the follow up, the average score was 74.5% (35.75/48). An unpaired t test with Welch's correction showed that the improvement in knowledge was statistically significant ($p<0.0001$, 95% CI 31.96-20.69). We are currently awaiting the second submission of the SAQ for the neuroanatomy workshop.
Conclusion: The feedback received from students as well as the results obtained shows that small group work teaching is effective in learning anatomy at medical school.

0561: MORPHOLOGY OF THE ANCONEUS MUSCLE AND ITS POSSIBLE USE AS A ROTATIONAL MUSCLE FLAP IN SNAPPING TRICEPS SYNDROME

P.R. Jayaram, Z.Y. Ng, J.H. Mitchell, Q.A. Fogg. *University of Glasgow, Glasgow, UK.*

Introduction: Snapping triceps syndrome is an uncommon cause of ulnar nerve dislocation. In severe cases, surgical measures are indicated, but data regarding outcomes is limited. The function of the anconeus muscle is also uncertain. This study aims to delineate the morphology of the anconeus muscle and explore its use as a rotational muscle flap.
Material and Methods: Five cadaveric upper limbs from four specimens were dissected (age=83.75±9.89years, M=2,F=2) to delineate the course of the anconeus muscle. The superior and inferior borders were reflected to investigate the neurovasculature beneath. Photographs and measurements were taken for qualitative and quantitative descriptions respectively.
Results: The anconeus is a triangular muscle 74.8±15.2mm long and 22.6±1.5mm thick proximally, tapering to 2.0±0.6mm distally. Its fibers were transversely oriented 54.5o±11.4o. In most specimens (n=4,80%), there were contributions of fibers from the triceps. The neurovascular pedicle was consistently found on the ulnar border consisting of the recurrent posterior interosseous artery and a radial nerve branch.
Conclusions: The anconeus muscle is likely a continuation of the triceps brachii. The location of the neurovascular pedicle and its length supports its use as a rotational flap. Its oblique orientation would also exert a lateral stabilizing force on the medial head of the triceps.

0562: VARIATIONS OF THE PES ANSERINUS WITH POTENTIAL FUNCTIONAL AND CLINICAL IMPLICATIONS

P.R. Jayaram, A.J. Freeman, N.A. Jacobson, Q.A. Fogg. *University of Glasgow, Glasgow, UK.*

Introduction: Current literature cites the importance of the tendons forming the pes anserinus for providing adequate tendon grafts. This study attempts to quantify the anatomy of these tendinous attachments.
Methods: Cadaveric legs (n=42) were dissected and photographed. The distal attachments of tendons were identified and individual tendinous bands were measured. The results were analysed to determine any morphological variations.
Results: The semitendinosus tendon produced variable bands and were designated ST1 (proximal), ST2, ST3 or ST4(distal). In all specimens, tendinous bands from the sartorius and gracilis muscles were observed, and ST4 bands extended anteriolaterally to contribute to the crural fascia, connecting the anterior and posterior compartments. The most proximal point of the gracilis was 49.66±8.95mm while the most distal point of the semitendinosus was 69.83±7.19mm from the tibial plateau. ST1 and ST4 bands were ubiquitous, whilst ST2 (28/42;66%) and ST3 (8/42;19%) bands were not.
Discussion: Six centimeters inferior to medial tibial plateau is presented as a reliable incision point for hamstring tendon harvest. The distal extension of the pes anserinus is greater than previously reported. These data provide a clear quantitative description of the pes anserinus and demonstrate the contribution of the semitendinosus tendon to the anterior and posterior compartments of the leg.

0580: USE OF CONNEXIN43 ANTISENSE ODN GEL COATED ALGINATE MICROSPHERES IN WOUND HEALING

Prashant Gujadhur, Suwan Jayasinghe, David Becker. *University College London, London, UK.*

Downregulating the gap junction protein Cx43 using Cx43 asODN has shown to improve the rate and quality of wound healing. The aim was to develop a suitable wound healing device using bioactivated alginate microspheres coated with such molecules. Using electrostatic bead generation, alginate microspheres were produced to be coated with a pluronic gel containing Cx43 asODN, and their effects on wound healing investigated on murine models. In vitro testing, including size distribution studies, pluronic gel interaction with alginate microspheres and asODN interaction

with alginate microspheres, took place. In vivo experiments were then carried out where wounds were harvested at day 1, 3 and 6 post wounding, and results analyzed macroscopically and microscopically. It was found that Cx43 asODN coated microspheres showed enhanced wound healing with advanced granulation tissue, faster re-epithelialisation, a down-regulation of Cx43 expression in the murine epidemis and less inflammatory response compared to wounds containing uncoated microspheres. However, bioactivated microspheres still showed a slower healing rate than no treatment wounds (acting as the control group). With further optimization of alginate microspheres, such Cx43 asODN gel coated microspheres could still be used as effective dermal substitutes in the future and have an important role to play in wound healing.

0690: ULTRASOUND INVESTIGATION OF VASTUS MEDIALIS OBLIQUE MUSCLE ARCHITECTURE: AN IN-VIVO STUDY

Shendy Engelina, Antonios Tony, Claire Robertson, Alban Killingback, Philip Adds. *St George's, University of London, London, UK.*

Aims: There is a significant relationship between the architecture of the vastus medialis oblique (VMO) and patellofemoral pain syndrome (PFPS). Historical data are largely derived from older populations, whereas PFPS commonly affects younger populations. This study aims to gather ultrasound data of the VMO architecture in young asymptomatic adults to provide baseline values for comparison with symptomatic sufferers.

Methods: The VMO fibre angle and insertion ratio were measured. The insertion ratio represents the proportion of the patella, which has the muscle fibres attaching to its medial border. Eighty knees from 40 subjects (18 males, 22 females, age range 20-30) were assessed with ultrasound. Individual Tegner-scores were recorded.

Results: The mean fibre angle and insertion ratio were 56.6° and 57.8%, respectively, with no significant difference between age groups. The insertion ratio was significantly higher among females. The fibre angle increased and the insertion ratio decreased as the Tegner-score increased.

Conclusion: The VMO fibre angle is not age related. There was a degree of overlap in the fibre angle values between healthy and pathological knees suggesting that the cause of PFPS is multifactorial. An individual's VMO architecture may be affected by their physical activity level, which could have important implications for PFPS.

0798: VEIN GRAFT TO AUGMENT FLEXOR TENDON REPAIRS – FEASIBILITY AND BIOMECHANICS

Mike Rodger. [1] *Princess Elizabeth Orthopaedic Centre, Royal Devon and Exeter Hospital, Exeter, UK;* [2] *Cardiff University, Cardiff, UK.*

Tendon rupture can cause substantial dysfunction and the best option for restoration of function is primary repair of the tendon. During rehabilitation movement to prevent adherence is associated with rupture and the tendon repair weakens during the early stages of healing. A gap of 3 mm predicts failure from either the repair snagging on surrounding structures or from a failure of new tendon to bridge the gap.

This experimental work assesses the feasibility of using a vein sleeve graft to augment a standard repair, a technique that has not been published before. It is hoped that a vein sleeve may represent a biological scaffold for tendon repair, it bridges early gaps and may confer improved biomechanical properties on the repair.

This work was undertaken to explore a new direction of applied surgical practice in order to make an incremental improvement in clinical outcome. In practice a vein may be harvested from the patient at the time of the tendon repair. Vein graft represents a cheap source of augmentation device, the costs being those of certainty of a surgical scar, risks of infection, nerve damage to the harvest site and increased surgical time.

0904: INTRAVENOUS FLUID THERAPY PRESCRIBING: IDIOSYNCRATIC, IRRATIONAL AND MISUNDERSTOOD

Ravi Aggarwal, Li Lin Hong, Nadia Deyalsingh, ChunKheng Khoo. *Nottingham City Hospital, Nottingham, UK.*

Introduction: 0.9% sodium chloride (NS) is widely used for intravenous fluid therapy (IVT). However, NS usage can lead to hyperchloraemic acidosis. The British Consensus Guidelines on Intravenous Fluid Therapy for Adult Surgical Patients (GIFTASUP) recommends balanced crystalloids instead of NS in situations other than hypochloraemia. Chloride levels are not routinely measured on standard biochemical assays, but are quantified on arterial blood gas (ABG) sampling. We audit IVT prescribing for patients following an ABG, when chloride levels are known, at two teaching hospitals.

Methods: Every inpatient who had an ABG analysis in the study period (3 consecutive days), and received IVT in the subsequent 24 hours was included in the study. Detailed fluid charts were compiled from patient records.

Results: 41 patients were eligible. 22 were normochloraemic and 17 were hyperchloraemic (median [Cl^-] 109mmol/L, range 107-119mmol/L). In these patients, 15 (38.5%) were prescribed NS (mean 1463ml). 2 patients were hypochloraemic ([Cl^-] 83 and 89mmol/L); neither received NS.

Conclusions: Despite guidelines to the contrary, more than a third of patients without hypochloraemia continued to be prescribed NS. In contrast, hypochloraemic patients received IVT containing relatively low or no chloride. IVT prescribing does not appear to be guideline driven or evidence based.

1191: FLUID MANAGEMENT OF THE SURGICAL PATIENT: RE-AUDIT

Shaukat Majid, Joanna Tremlett, Michael Rees, Vincent Chamary. *Royal Gwent Hospital, Newport, UK.*

Aim: Fluid management is critical. The British Consensus Guidelines for Intravenous Fluid Therapy for Adult Surgical Patients (GIFTASUP) recommend the use of balanced salt solutions to replace normal saline for resuscitation/replacement. For maintenance, patients should receive 40-80mmol/day potassium. Previous audit three months earlier at our hospital had shown poor awareness/compliance. We therefore re-audited fluid management on all three general surgical wards a month after presenting the study at our surgical meeting.

Methods: General surgical in-patients prescribed more than one litre of fluids over 24hours were included. This was over two consecutive working weeks divided into 24hour episodes. Data was collected prospectively using the same proforma from initial study. Patients were divided into three groups -maintenance(NBM without gastrointestinal losses), replacement(patients with gastrointestinal losses)and supplementary.

Results: There were 88 24hr episodes. Normal saline usage was 50%(15/30) and 36%(17/47) in the maintenance and supplementary groups respectively. Potassium usage 57%(17/30) and 64%(7/11) in the maintenance and replacement groups respectively.

In our previous audit normal saline usage was 60%(17/28) and 54%(19/35) in the maintenance and supplementary groups. Potassium usage 32%(9/28) and 66% in the maintenance and replacement groups.

Discussion: Presentation of initial audit did improve compliance to the guidelines. We suggest that fluid management be included into mandatory surgical induction/teaching.

1223: AN INVESTIGATION INTO PERIOSTEAL THICKNESS AT COMMON OSTEOPOROTIC FRACTURE SITES

Raashad Hasan, Antonios Tony, Adds Philip. *St George's, University of London, London, UK.*

Aims: The periosteum is increasingly considered to be implicated in bony pathologies, such as osteoporosis. This study aimed to investigate whether changes in the periosteum can be associated with osteoporotic risk factors, in particular age and sex, at common osteoporotic fracture sites.

Methods: Six cadavers (3 males and 3 females, mean age 81 years) providing two femoral necks and two distal radii, and two distal ulnae were dissected. These were sectioned, decalcified and histologically stained. Using light microscopy, the periosteal thickness was measured. One-way ANOVA and f-test were used for statistical analysis.

Results: Mean periosteal thickness for males was greater at all sites, though only the left ulna site was statistically significance ($p = 0.007722$). In both male and female groups, periosteal thickness decreased with age ($p<0.001$). Site-specific differences in periosteal thickness were also found to be highly significant across all sites of interest ($p < 0.0001$).

Conclusion: Differences in periosteal thickness between age and sex are clearly observable at common osteoporotic fracture sites. This has potential implications for the pharmacological intervention and management of osteoporosis, and for the prevention of associated fractures. Current work is focusing on measuring a larger population of femoral necks periosteal thickness.